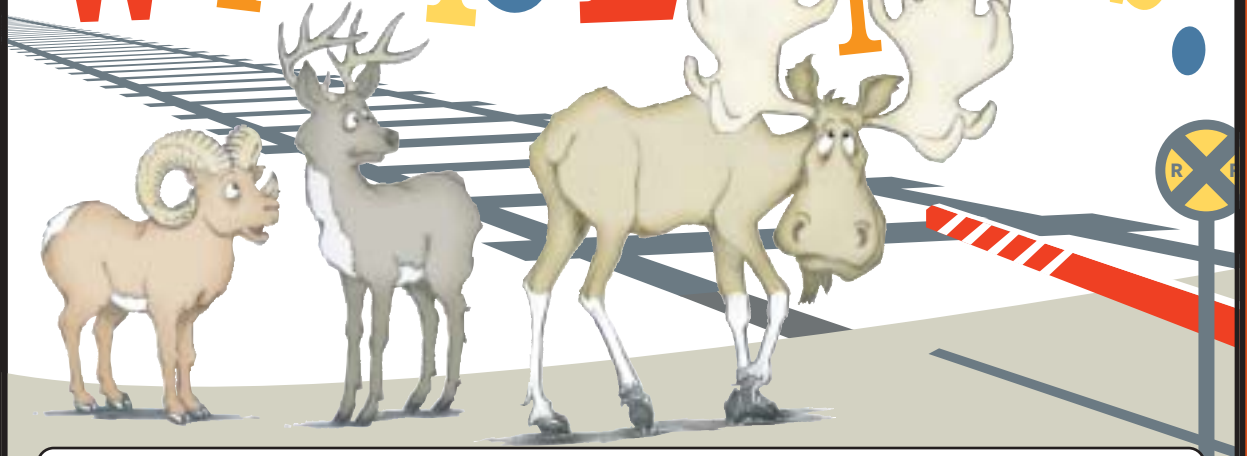
Wildlife Express!



Volume 16 Issue 9 May 2003

Fight the Bite

IDAHO FISH & GAME

Meet the Mosquito

EEEEE - A high-pitched whine buzzing in your ear. You may hear it while sitting around a campfire or while playing in your backyard. Just mention mosquitoes, and the skin on some people starts to itch and crawl. Whether you love them, hate them or just tolerate them, one thing's for sure, mosquitoes are interesting insects.

There are about 2,700 species of mosquitoes in the world. Mosquitoes may be found in many different habitats. They may live in hot tropical forests or cold northern lands. Mosquitoes can be found from sea level to over 10,000 feet above sea level.

Although they may be found in many different places, all mosquitoes need water. Mosquitoes lay their eggs in water and develop and grow in water. They have four life stages: egg, larva, pupa and adult. All life stages of a mosquito, except for the adults, are **aquatic** – they live in water.

Male and female mosquitoes do not look the same. Females are usually larger than males and have thin **antennae** (an-TEN-ee). Males have bushy, hairy antennae.

Mosquitoes have short lives. It takes between seven to 14 days for a mosquito egg to become an adult. Adult female mosquitoes can live several weeks. Males usually live less than a week.

Mosquitoes eat different things at different stages of their lives. **Larvae** (LAR-vee) eat plants. They also filter food from water. Larvae are so good at filter feeding; they can actually help clean polluted water! But the water can't be too polluted. Larvae breathe from a tube at the end of their bodies. If the tube gets clogged with oil or other things, they will suffocate.

Both male and female adult mosquitoes eat nectar. Only female mosquitoes suck blood. They need a protein found in blood to make their eggs.

Mosquitoes use their senses of sight and smell to find a blood meal. They see movement and infrared light given off by warm bodies. They can also smell chemicals, like **carbon dioxide** and **lactic acid**, on your breath, as well as smell chemicals on your skin. A mosquito can smell you when it is over 100 feet away!

Have you ever noticed that mosquitoes seem to bite certain people more often? It's true. Everyone has a different smell. Mosquitoes do like the smell of some people over other people.

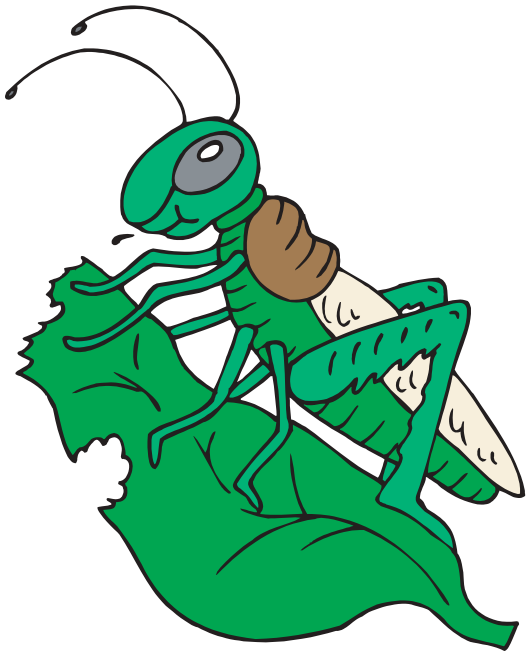
The tip of a mosquito's mouth has six needle-like parts for cutting and sucking. To suck blood, a mosquito slips the tip of its mouth into the skin. The mosquito then injects **anticoagulants** (an-ti-ko-AG-yu-lents) into the cut. This keeps the blood runny and thin, so the mosquito can suck up the blood. The anticoagulants are not supposed to be in your body. Your body tries to break up and get rid of the chemicals, causing an itchy bump.

Although mosquitoes may drive you crazy with their biting, they are an important part of nature. Mosquitoes are important parts of the food web. They are food for fish, bats, birds, spiders and other insects. In fact, some bats may eat 600 mosquitoes in just one hour of hunting. If there were no mosquitoes in the world, we might not have as many other animals. Mosquitoes also help pollinate flowers when drinking nectar.

Next time you hear EEEEE, try to think of something positive about mosquitoes. They may irritate you with their biting, but they are important to have around.

IDAHO FISH & GAME

Harmful Things Insects Do



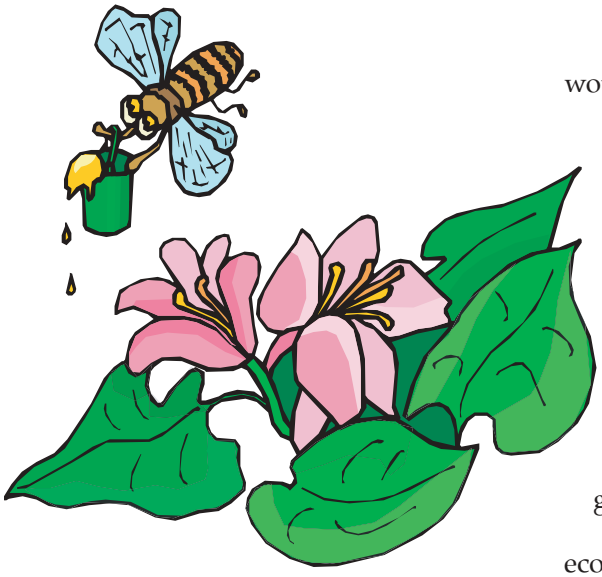
Insects may cause humans harm by the things that they do. Biting and stinging insects probably come to your mind first. Insect bites and stings may not only be irritating, but could also be dangerous. Some people have deadly reactions to bee stings. Insects may also spread and transmit diseases to people and animals with their bites.

Some insects like to eat the same things we do and may destroy crops. Cotton, corn, wheat, potatoes, apples and oranges are just a few plants that can be damaged by insects.

Insects can eat any plant or animal product. Flour beetles, grain weevils and other pests will feed on stored grain, cereals, pet food and powdered chocolate. Just about everything in the kitchen that is not protected may be eaten by insects. Insects may even eat our clothes, homes and the glue in books.

Trees used to make lumber and paper can be attacked by insects. Moth, beetle and other insect larvae burrow into trees. Burrowing insects may cut the vessels that move water and food up and down the tree. This can kill the tree. Insects also bring diseases into trees on their feet and bodies, harming and killing the trees. Sometimes it seems like all insects are a problem!

Beneficial Things Insects Do



Our lives would be very different without insects. It is unlikely that we would be able to survive on earth without them.

We need insects to help us make food. Insects pollinate more than 200 species of crop plants in the United States. Without insect pollination, there would be no carrots for salads, no watermelon or apple pie, no vanilla or strawberry ice cream, and that's just the beginning.

There would be no honey, silk, inks and dyes, or other useful products. Insects and insect parts are used to make jewelry, beads and pictures. Insect products are even used to make medicines for arthritis and infections.

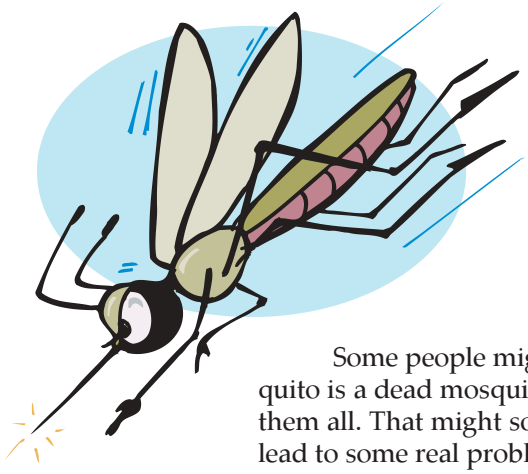
Insects are important parts of the food web that connects all animals and plants. Bats, skunks, raccoons and fish depend upon insects for the majority of their food.

Dead trees, dead animals and animal droppings would cover the ground if we did not have insects to decompose them.

Insects are valuable scientific tools. They have been used for studying ecology (e-KOL-e-jee), evolution (ev-e-LOO-shen) and genetics (je-NET-iks). Because grasshopper and cockroach nerves are similar to humans, they have been used to test the effects chemicals might have on people.

Insects also provide enjoyment for people. Many people like to watch and photograph butterflies and other insects. In China, people have a 2000-year history of enjoying the songs of crickets and keep them in cages.

The Bearer of Bad News



Poor mosquitoes. They don't mean to be the bearers of diseases, but sometimes that is exactly what happens. Since mosquitoes bite animals and people to suck blood, they are sometimes the perfect way for diseases to spread.

Mosquitoes often bite more than once to get the blood they need. They might bite a person, bird, cat, or turtle and then bite another person. This biting can help spread **bacteria** (bak-TER-ee-a), **parasites** (PAR-a-sites) and viruses.

There are many different diseases that mosquitoes may spread. Many of these are found in tropical places. West Nile, **encephalitis** (in-sef-a-LITE-es), yellow fever, **dengue** (DEN-gee) and **malaria** (ma-LAR-ee-a) are all diseases spread through mosquito bites. Mosquitoes don't get the diseases themselves. They just carry the diseases in their stomachs or salivary glands and spread them from one host to another.

Malaria is a disease that was once found in the United States. From Colonial times until well after the Civil war, malaria was found in parts of the Mississippi Valley and the Chesapeake Bay. **Insecticides** (in-SEK-ta-sides) helped to kill mosquitoes that carried malaria. It is hard to find malaria in the United States today, but in other countries, malaria is on the rise.

Malaria is common in Africa and affects people living in India, Southeast Asia, the Middle East, and Central and South America.

Malaria found a friend in mosquitoes. A mosquito picks up the malaria parasite when biting a person who already is sick. The parasites reproduce in the mosquito's gut then travel to the mosquito's salivary glands. The parasites are then ready to be injected into the next person the mosquito bites.

Malaria makes people sick by attacking their red blood cells. These are the blood cells that carry oxygen throughout the body. Malaria can be treated with medicines.

Mosquitoes do help spread diseases, but is it really the mosquitoes' fault? The parasites, bacteria and viruses are just taking advantage of a free ride. They want to multiply themselves just like all other living things. Mosquitoes just happened to be the perfect tool to make that happen.

Why Not Kill Them All?

Some people might think that the only good mosquito is a dead mosquito. Let's use chemicals and just kill them all. That might sound like a good idea, but it could lead to some real problems.

In the past, people used chemicals to kill mosquitoes that carried malaria. It seemed like a good idea at the time, but now there are more mosquitoes than in the past. Malaria is back on the rise. How did that happen?

The problem with using chemicals is mosquitoes can get used to them. Certain insecticides will no longer work on 50 species of mosquitoes. They have been sprayed with chemicals so many times they have adapted to resist them. These mosquitoes then become super insects and are harder to kill. Newer tougher chemicals need to be used. This can become expensive. Many countries cannot afford to use chemicals.

You might also end up killing animals you did not want to kill. Remember, mosquitoes are part of the food web. Killing them may also mean killing the animals that eat them. This is what happened when people used DDT.

DDT did kill mosquitoes, but it also killed beneficial insects and affected birds' eggs. Birds ate insects that had been sprayed with DDT. The chemicals got into the birds' bodies and made the shells of their eggs thin. When the birds sat on their eggs, the eggs broke. DDT is one chemical that led to the decline of peregrine falcons and other birds. DDT can no longer be sold in this country, but it is still used in other parts of the world.

If chemicals are not a good idea, how do you control mosquito numbers? Getting rid of standing water is the first thing. Remember, mosquitoes lay their eggs in water. Take the water away, and you will have fewer mosquitoes.

Researchers are also coming up with other ideas. They are looking for something in nature that kills mosquitoes, and they may have found a parasite that does just that. The parasite does not kill adult mosquitoes, but does kill the larvae. An adult mosquito lays her infected eggs in water. The eggs turn into larvae. The parasite kills the larvae and is released into the water. Other larvae in the water pick up the parasite spores. When they become adults, they spread the parasite in their eggs and infect other mosquitoes.

Infected adults are not as strong as healthy adults. They have to feed the parasites in their bodies, so they do not live as long as normal mosquitoes. Over time, many mosquitoes will become infected with the parasite and fewer mosquitoes should be around to spread malaria.

This is a more natural way to kill mosquitoes and should be safer for the environment than using chemicals.

IDAHO FISH & GAME

Is it an insect?

They are on the ground, in trees, in soil and in your house. They make up about 80 percent of all known animal species on Earth. Insects are all around us. They are common in every habitat except the ocean.

Sometimes any small creepy crawly is called a bug or insect, but not every small creeping thing **is** an insect. To be an insect, an animal must meet three important rules. They must have three main body parts – the head, **thorax** (THOR-aks) and **abdomen** (AB-do-men), six legs and two antennae.

The head of an insect has the eyes, antennae and mouthparts on it. Insects have two large **compound eyes**. Compound eyes are **faceted** (FAS-et-ed). They have more than one lens or surface. Compound eyes look a bit like a honeycomb. Insects may also have up to three simple eyes. You have simple eyes. A simple eye has one surface or facet. Without moving their heads, many insects can see in every direction around them. Insect antennae are used for touching, smelling and sometimes hearing. The mouthparts of insects are made to suck or to chew depending upon the insect and what it eats.

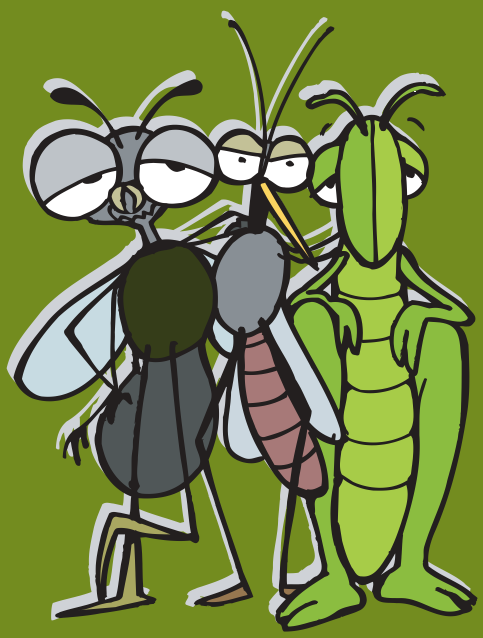
The thorax, or middle part of an insect, is where the wings and legs are found. All adult insects have legs, but not all insects have wings. Mosquitoes have four wings. The two front wings are used for flying and the back wings help the mosquito to keep its balance in the air.

The abdomen is where an insect breathes. Most insects breathe through tiny holes called **spiracles** (SPIR-i-kels). Insects that live in water would drown if they had spiracles. Some aquatic insects breathe with gills like a fish. Other insects come up to the surface of the water and grab a bubble of air or stick a breathing tube above the water.

Insects do not have an internal skeleton of bone like you. Insects have an **exoskeleton** (ek-so-SKEL-et-en). An exoskeleton is a hard fingernail-like covering on the outside of the insect's body. The exoskeleton is divided into separate pieces called plates. The plates fit together like a puzzle and are held together with soft flexible membranes. The membranes work like rubber bands. They allow the insect to move its body and let the insect's abdomen grow while it eats. The exoskeleton can flex but not expand. As insects grow, their exoskeletons become too small. They shed their exoskeletons when they outgrow them. Just like a snake sheds its skin.

Insects come in all shapes and sizes. Hairy winged beetles are some of the smallest of insects. They can crawl through the eye of a needle. Fairyflies are also small. They can fly through the eye of a needle. The longest insect is a 13-inch long walkingstick found in Malaysia. Atlas moths in India have the largest wings at 12 inches across. Goliath beetles found in Africa are the bulkiest and heaviest. They can be as big as a baseball.

Wow, what diversity. Insects surely are amazing animals!



Other Creepy Crawlers

You turn over a rock in your backyard, and something darts quickly away. You see more than six legs, so it can't be an insect. What is it?

You may call the creepy crawler a bug, but most likely it is not a true bug. A bug is actually a type of insect. Bugs are insects that have four wings and sucking mouthparts. The two bottom wings are lacy, and the top wings are leathery with lacy tips. Water skippers are examples of true bugs.

The creepy crawler you saw running away was probably another type of **arthropod** (AR-thre-pod). Arthropods are animals that include insects and their relatives. All arthropods have exoskeletons and jointed legs. The word arthropod means jointed foot.

Arthropods are divided into five main groups: **arachnids** (e-RAK-nids) (spiders, ticks, mites, scorpions), **crustaceans** (krus-TA-shens) (crabs, lobsters, crayfish, shrimps, sowbugs or rolly pollies), centipedes, millipedes and insects.

West Nile Virus

A disease is coming to Idaho that has never been here before. It is West Nile **virus** (VI-rus).

West Nile virus has not always been in the United States. Scientists first found it in New York City in 1999. Where did it come from? West Nile virus has been found in Africa, Eastern Europe, West Asia and the Middle East for a long time. The type of West Nile virus now found in the United States looks like it came from the Middle East.

People can become infected with West Nile virus from mosquito bites. Mosquitoes don't have the disease but get the virus after biting a bird with the disease. The virus goes to the mosquito's salivary glands or spit glands. When a mosquito bites a person or animal, the virus is injected into the body.

Your chance of getting West Nile virus is slim. Only 1 out of every 100 mosquitoes carries West Nile virus. Most people bitten by a mosquito infected with the virus will not get sick. Some people may feel like they have the flu or a cold. Only a very small number of people will get seriously ill.

West Nile virus is most dangerous to animals, especially birds and horses. West Nile virus has been found in 150 species of birds, bats, squirrels, skunks, cats, dogs, even an alligator. Crows and their relatives (magpies, ravens and jays) seem to get sick and die from West Nile virus more than other animals. Scientists think that when the virus starts to show in Idaho, we may see birds that are dead or dying.

Scientists would like to know if people do find dead birds. This will help them track where the virus is spreading.

If you see dead birds, do not touch them. Tell a grownup about the birds and have them call your local Fish and Game office or Central District Health office. If adults pick up a dead bird, they should wear plastic gloves. They need to place the dead bird in a plastic bag and then put another plastic bag around the first one.

Birds that have just died should be taken to your local Fish and Game office or Central District Health office. They will test the birds to see if the birds have West Nile virus. If the birds have been dead longer than two days, place the birds in plastic bags and put them in the garbage. The virus can only live in a dead bird for two days.

Horses are also affected greatly by the virus. Luckily, for horses, they have a **vaccine** (vak-SEEN) for West Nile virus. People can have a veterinarian give their horses a shot that will protect them from getting sick.

The best way to help slow the spread of West Nile virus, is to reduce the number of mosquitoes. The best way to reduce mosquito numbers is to get rid of the water where they lay their eggs. Any little puddle of water can be a mosquito nursery. Look for anything outside that might hold water, even a bottle cap. Empty any container that has water in it and remove it. Water in wading pools and birdbaths should be changed at least every three days.

West Nile virus is coming and once here, it is here to stay. The best thing you can do is look out for water and dump it. You know you will be doing your part to help slow the spread of West Nile virus.

Don't Feed on Me!

Don't want to be a mosquito's next blood meal?
Here are some ideas to avoid mosquito bites:

- Most mosquitoes are active and bite between sunrise and sunset. Try to stay indoors after the sun goes down.
- Wear long pants, long sleeved shirts, socks and a hat when outdoors.
- Use an insect repellent that contains 10 percent or less DEET. Don't get repellant in your mouth, eyes or nose or on your fingers.
- Try not using repellant if you can.
- Make sure window and door screens fit well and have no holes.
- Mosquitoes don't like the wind. A windy day will have less mosquitoes buzzing about.

Use the words from the word list to fill in the blanks.

MOSQUITOES
WEST NILE VIRUS
THORAX
POLLINATE
WATER
DISEASES
SUNSET
SMELL
FEMALE
ARTHROPODS

s	a	w	e	s	t	n	i	l	e	v	i	r	u	s
u	f	q	j	n	o	p	x	m	s	m	e	l	l	e
n	h	f	w	b	a	g	d	d	j	z	c	v	u	r
s	o	e	y	k	t	l	o	s	f	j	t	i	a	b
e	n	m	u	y	h	p	o	l	l	i	n	a	t	e
t	e	a	c	d	o	u	h	l	m	w	i	y	f	k
k	g	l	b	r	r	o	d	i	s	e	a	s	e	s
e	g	e	h	p	a	h	u	y	r	v	n	t	j	f
js	t	s	c	x	o	u	b	j	r	e	i	e	r	
x	r	a	m	o	s	q	u	i	t	o	e	s	p	r
a	r	e	s	i	m	o	s	t	h	u	s	w	q	u

Find the words in the puzzle.

1. **Insects, crabs and spiders are all _____.**
2. **There are 2700 species of _____ in the world.**
3. **Insects _____ many plants that we eat.**
4. **Insects have three body parts – the head, _____, and abdomen.**
5. **Mosquitoes need _____ to reproduce.**
6. **Only _____ mosquitoes suck blood.**
7. **Mosquitoes use their senses of sight and _____ to find a blood meal.**
8. **Mosquitoes can spread _____ from one animal to another while biting and sucking blood.**
9. **_____ is most dangerous to birds and horses.**
10. **Mosquitoes do most of their biting from sunrise to _____.**

WILDLIFE EXPRESS

Volume 16 ● Issue 9 ● *The Mosquito* ● May ● 2003

Wildlife Express is published nine times a year (September-May) by the Idaho Department of Fish and Game. Classroom subscriptions and an Educator's Guide are available for $30.00 per year and includes a classroom set of 35 copies mailed to your school each month. Subscriptions of five copies or less are available for $10.00.

Wildlife Express is also available on the Idaho Department of Fish and Game Website at no charge at **WWW2.state.id.us/fishgame**. For more information, call or write: ***Wildlife Express,* Idaho Department of Fish and Game, 600 South Walnut, PO Box 25, Boise, Idaho, 83707 (208) 334-2633.**

Writers & Contributors: Lori Adams ● Brenda Beckley ● Dave Cannamela ● Adare Evans ● Kevin Frailey ● Ed Mitchell ● Renai Brogdon

Layout and Design: Alyssa Faaborg ● Web Design: Gina Glahn ● Masthead Design: Eric Stansbury

WE WOULD LIKE TO HEAR FROM YOU !

If you have a letter, poem or question for Wildlife Express, it may be included in a future issue! Send it to the address printed above!